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Notice of Allowability	Application No.	Applicant(s)	
	09/932,977	PAN ET AL.	
	Examiner	Art Unit	
	Arnold M Kinkead	2817	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 07-06-04.
2. ☒ The allowed claim(s) is/are 1-35 and 39.
3. ☒ The drawings filed on 06 August 2003 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

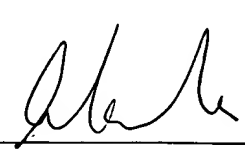
Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|---|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input checked="" type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |



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1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. James Remenick on 9-30-04.

The application has been amended as follows:

1. (currently amended) A millimeter- and submillimeter-wave noise apparatus for generating millimeter- and submillimeter-wave noise, without a local oscillator, wherein said millimeter- and submillimeter-wave noise comprises a continuum of random noise in the range between about 60 GHz and about 1.2 THz comprising:

a microwave noise source; means for generating millimeter- and submillimeter-wave noise, without an oscillator, wherein said millimeter- and submillimeter-wave noise comprises a continuum of random noise in the range between 110 and about 400 GHz

a frequency multiplier that accepts a designated power level from said microwave noise source and produces millimeter- and submillimeter-wave noise, wherein said designated power level is no higher than a maximum safe input power level for said frequency multiplier; and
a transmission structure.

2. (currently amended) The apparatus of claim 1, wherein said millimeter- and submillimeter-wave noise ~~further~~ comprises one or more continuous frequency bands in the range ~~between~~ from about 60 GHz to 110 GHz.

3. (currently amended) The apparatus of claim 2 ~~1~~, wherein said millimeter- and submillimeter-wave noise ~~spectrum is~~ comprises one or more continuous across a frequency bands in the range of frequencies from about 60 GHz to about 400 GHz.

4. (currently amended) The apparatus of claim 1, wherein ~~said means for generating~~ said millimeter- and

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submillimeter-wave noise comprises a one or more continuous frequency multiplier for converting microwave noise into said noise bands in the range from about 400 GHz to about 1.2 THz.

5. (currently amended) The apparatus of claim 1, wherein said ~~means for generating said millimeter- and submillimeter-wave noise~~ source further comprises a harmonic mixer.

6. (original) The apparatus of claim 1, wherein said apparatus is portable.

7. (original) A spectrometer comprising the apparatus of claim 3.

8. (original) The spectrometer of claim 7, wherein said spectrometer is a Fourier Transform Spectrometer.

9. (currently amended) A method of producing millimeter- and submillimeter-wave noise, without ~~an~~ a local oscillator, comprising:

generating a first noise band having a designated power level; and

inputting said first noise band into a frequency multiplier, wherein said designated power level is a maximum safe input power level of said frequency multiplier; and

converting said first noise band into a second noise band, wherein said second noise band comprises a continuum of random millimeter- and submillimeter-wave noise.

10. (currently amended) The method of claim 9, wherein said second noise band is continuous across a range of frequencies from about 60 GHz to about 400 GHz.

11. (original) The method of claim 9, wherein said second noise band is continuous across a range of frequencies from about 60 GHz to about 1 THz.

12. (currently amended) The method of claim 9, wherein said first noise band comprises noise of frequencies between about 0.1 GHz to about 60 GHz.

13. (currently amended) The method of claim 9, further comprising adjusting said first noise band to a the designated power level prior to said converting step.

14. (currently amended) The method of claim ~~13~~ 9, wherein said ~~converting step comprises:~~
~~inputting said adjusted first noise band into a frequency multiplier, wherein said designated~~

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~~power level is a maximum safe input power level of said frequency multiplier~~ the millimeter- and submillimeter-wave noise has a noise power level that is at least two orders of magnitude higher than noise power emitted from a mercury arc lamp.

15. (original) The method of claim 13, wherein said adjusting step comprises amplifying a power of said first noise band.

16. (original) The method of claim 13, wherein said adjusting step comprises attenuating a power of said first noise band.

17. (original) The method of claim 9, further comprising directing said second band of noise toward a destination.

18. (currently amended) A millimeter- and submillimeter-wave noise generating apparatus comprising:
a microwave noise source for generating microwave noise;
~~means~~ an adjustment device for adjusting a power of said microwave noise source to a designated level;
and

a frequency multiplier for converting said adjusted microwave noise into a continuum of millimeter- and submillimeter-wave noise, wherein said designated level is a maximum safe input level of said frequency multiplier and wherein the millimeter and submillimeter noise is generated without ~~an~~ a local oscillator.

19. (currently amended) The apparatus of claim 18, wherein said ~~means for adjusting~~ adjustment device comprises one or more microwave amplifiers.

20. (currently amended) The apparatus of claim 19, wherein said ~~means for adjusting~~ adjustment device further comprises a level-set attenuator.

21. (currently amended) The apparatus of claim 18, wherein said millimeter- and submillimeter-wave noise is comprises one or more continuous frequency bands across a frequency range of about 60 GHz to about 400 GHz.

22. (currently amended) The apparatus of claim 18, wherein said millimeter- and submillimeter-wave noise is comprises one or more continuous frequency bands across a

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frequency range of about 60 GHz to about 1 THz.

23. (original) The apparatus of claim 18, further comprising a transmission structure coupled to an output of said frequency multiplier for directing said millimeter- and submillimeter-wave noise.

24. (original) The apparatus of claim 18, wherein said microwave noise source is selected from the group consisting of: a diode noise source, a noise tube, and a thermal noise source.

25. (original) The apparatus of claim 18, wherein said frequency multiplier is a semiconductor diode multiplier.

26. (original) The apparatus of claim 18, wherein said apparatus is portable.

27. (original) The apparatus of claim 18, further comprising one or more band-pass filters coupled to said frequency multiplier to create one or more discrete millimeter- and submillimeter-wave noise bands.

28. (original) A spectrometer comprising said apparatus of claim 18.

29. (currently amended) A method for generating millimeter and submillimeter-wave noise power, without an a local oscillator, comprising:

producing microwave noise power;

amplifying said microwave noise power into amplified noise power;

adjusting said amplified noise power to a designated power level; and

converting said adjusted noise power to a continuum of millimeter- and submillimeter-wave noise through a frequency multiplier, wherein said designated power level is the maximum safe input level of said frequency multiplier.

30. (original) The method of claim 29, further comprising testing millimeter- and submillimeter-wave components using said millimeter- and submillimeter-wave noise.

31. (original) The method of claim 29, further comprising:

directing said millimeter and submillimeter noise from said frequency multiplier into a Fourier Transform Spectrometer; and

performing Fourier Transform Spectrometry on a test sample.

32. (original) The method of claim 29, further comprising characterizing materials using said millimeter- and submillimeter-wave noise.

33. (currently amended) The method of claim 29, wherein said millimeter- and submillimeter-wave noise is continuous across the frequency range between about 60 GHz to about 400 GHz.

34. (original) The method of claim 29, wherein said millimeter- and submillimeter-wave noise is continuous across the frequency range between about 60 GHz to about 1 THz.

35. (currently amended) A noise generator ~~comprising a means~~ for generating noise without a local oscillator, wherein said noise has a noise temperature greater than 2000°K and comprises one or more continuous frequency bands in the range consisting essentially between 110 about 60 GHz to about 1.2 THz comprising one or more frequency multiplier chains for converting microwave noise into said noise; and a transmission structure.

36. (**currently canceled**) The apparatus of claim 35, wherein said noise further comprises one or more bands in the range between about 60 GHz to 110 GHz.

37. (**currently canceled**) The apparatus of claim 36, wherein said noise is continuous across a range of frequencies from about 60 GHz to about 1.2 THz.

38. (**currently canceled**) The apparatus of claim 35 wherein said noise generator comprises one or more frequency multiplier chains for converting microwave noise into said noise.

39. (**new**) The apparatus of claim 1, wherein the output noise has a noise power level that is at least two orders of magnitude higher than said millimeter- and submillimeter-wave noise power emitted from a mercury arc lamp.

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2. The following is an examiner's statement of reasons for allowance: The examiner could not find fair suggestion in the prior art for the noise generator as claimed presently, without a local oscillator, for producing the MMW ranges...also nor suggestion for operation with the maximum safe input level for the multiplier input...The reference to Roser, for example, is silent on these additional limitations.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled " Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arnold M Kinhead whose telephone number is 571-272-1763. The examiner can normally be reached on Mon-Fri, 8:30 am -5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Pascal can be reached on 571-272-1769. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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A handwritten signature in black ink, appearing to read "Arnold M Kinkead".

Arnold M Kinkead

Primary Examiner

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Arnold Kinkead

Sept. 30-04